

HARDY NATIVES AT HOME

ON THE U.S. RANGE

You have four legs, a four-part stomach, and you're ready for a snack. What's to eat?

If you're lucky, you may soon be munching on Timp Utah sweetvetch—a tasty native plant having a pink-to-purple flower.

Timp, along with Rimrock Indian ricegrass and Sand Hollow squirreltail, are native plants readied for growers by scientists at the ARS Forage and Range Research Laboratory in Logan, Utah, and their colleagues.

JACK DYKINGA (K8662-1)



◀ Seed heads of various native grasses (left to right): western wheatgrass, Snake River wheatgrass, Indian ricegrass, Great Basin wildrye, squirreltail, and green needlegrass.

▶ Geneticists Steven Larson and Kevin Jensen observe inherited traits in hybrids resulting from crosses between Great Basin wildrye and beardless wildrye.

▼ Geneticist Tom Jones examines Utah sweetvetch flowering at North Ogden Pass in the Wasatch Mountains.

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Hardy and well-adapted, these plants help hold soil in place and revegetate lands denuded by wildfire or disturbed by mining. What's more, they help stop the takeover of native ecosystems by invasive weeds like cheatgrass.

"Our lab is the only Agricultural Research Service unit that breeds native plants for western ranges," says N. Jerry Chatterton, the head of the Logan laboratory. "Although we have also produced non-native grasses for planting in the West, we help develop natives, as well, because in some instances native species are the best plants for the job at hand."

colleagues from USDA's Natural Resources Conservation Service (NRCS) Plant Materials Center at Meeker, Colorado; USDA's Forest Service; the State of Utah; and Colorado and Utah State Universities.

Johnson and colleague Timothy M.J. Ford—at that time a graduate student—scrutinized Timp and other candidate sweetvetches during 3 years of greenhouse and outdoor tests. They monitored about 40 key traits, including how much leaf and root tissue the plants produced. They also compared the plants' ability to fix nitrogen; that is, to capture the gaseous form of this nutrient from the atmosphere and turn it into fertilizer.

A Taste-Tempting Legume

Timp Utah sweetvetch, *Hedysarum boreale*, belongs to the legume family, so it is a relative of peas and beans. Timp is best suited for its native intermountain region of Utah, Colorado, Wyoming, and Idaho, and—within that region—thrives in areas with 12 to 18 inches of annual precipitation.

Its abundant, attractive flowers produce long, flattened seedpods that, when still green and soft, can be eaten by animals. It provides early spring forage not only for cattle and sheep, but for wild ruminants as well, including deer, bison, elk, and moose.

"This plant is so popular with animals," says ARS plant physiologist Douglas A. Johnson at Logan, "that, after planting, it needs to be protected from grazing for about a year to give it a chance to get established."

Scientists selected Timp from among other promising candidates because of its vigor, adaptability, and seed production. The ARS researchers worked with

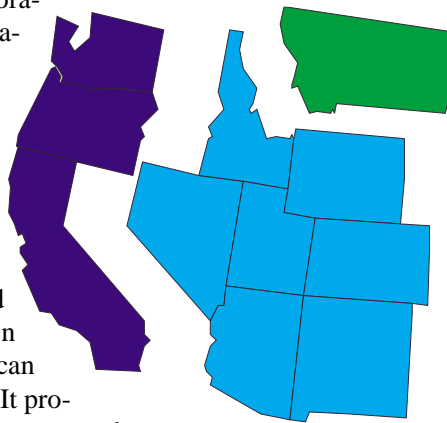
Restoring With Rimrock

Animals looking for another snack might try Rimrock Indian ricegrass, or *Achnatherum hymenoides*. A perennial bunchgrass, Indian ricegrass ranges from the western Great Plains west to the Cascades and the Sierra Nevada, according to Logan plant geneticist Thomas A. Jones.

"Rimrock," he says, "is ideal for restoring damaged native ecosystems on sandy soils."

Jones tested it with co-researchers from the NRCS Plant Materials Center at Bridger, Montana, and the agricultural experiment stations of Montana and Wyoming.

Ricegrass gets its name from its stalks. When in bloom, they vaguely resemble those of a rice plant. "Some Native Americans who lived in the Great Basin," says Jones, "used ricegrass seed for food. They ground it into flour for making a nut-flavored mush."





Rimrock's seeds also make an excellent food for game birds like mourning dove and valley quail or for songbirds such as green-tailed towhee. What's more, it retains mature seed longer than many other Indian ricegrasses—even in high winds and heavy rains.

"Discovering that trait in Rimrock," says Jones, "was our most important contribution to this collaborative research." Indian ricegrasses that retain seed longer are desirable because their seed has a better chance of staying on the plant until harvest instead of dropping to the ground.

"Better seed retention," Jones says, "should help make mechanical harvesting easier and less expensive. That lowers the cost of producing seed and opens the door to wider use of Indian ricegrass in the West."

A Grass Called Squirreltail

Sand Hollow squirreltail—named for its showy, plumelike heads—grows up

to 20 inches tall. A perennial, squirreltail is known to botanists as *Elymus elymoides*.

Sand Hollow is the first squirreltail released for commercial production. Says Jones, "It withstands wildfires and germinates readily."

Jones and colleagues selected Sand Hollow from among squirreltails collected at sites in more than a half-dozen states, including California, Colorado, Montana, Nevada, Utah, Washington, and Wyoming. The scientists put the plants through 3 years of outdoor evaluation in Utah.

One of Sand Hollow's primary intended uses is to restore rangelands currently overwhelmed by highly aggressive, non-native plants such as cheatgrass or medusahead wildrye. The native plant, Jones says, is best suited for sandy soils throughout the Snake River region of southern Idaho, as well as in parts of Oregon, Nevada, and Utah.

Its attractive golden plumes produce more seeds than the other squirreltails





◀ Far left photo, geneticist Tom Jones and plant physiologist Doug Johnson (right) observe seed head maturity in a cultivated plot of squirreltail.

◀ In an ARS test plot (on a University research farm) Utah State University research assistant Mayme Seng pollinates Snake River wheatgrass.

▶ In a cultivated field of bluebunch wheatgrass, geneticists Kay Asay (left) and Tom Jones discuss seed yields.

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tested by Jones, ARS colleague Douglas A. Johnson, and scientists with Utah State University and with NRCS' Plant Materials Center at Aberdeen, Idaho.

"Native plants," says Jones, "are often erratic in seed yield—that is, the pounds per acre of seed that they produce. For that reason, Sand Hollow's prolific seed production is among its most valuable traits."

Sand Hollow squirreltail may soon have a role in restoring burned-out sites at the unique Snake River Birds of Prey National Conservation Area located about 35 miles south of Boise, Idaho. This 81-mile stretch of winding canyon and broad plain is home to what is thought to be the country's greatest concentration of nesting birds of prey—eagles, falcons, hawks, ospreys, and owls.

"Sand Hollow," says Jones, "could help restore habitat used by small animals like Townsend's ground squirrels, a favorite of prairie falcons, or by the black-tailed jackrabbits that are essential to the survival of golden eagles."

The area's destructive cycle of wildfires is blamed largely on cheatgrass, an alien annual plant that dries out in summer, providing an ideal fuel each year for wildfires. "In the past 20 years," Jones says, "more than 60 percent of the conservation area's grass and shrub ecosystem has been hit by wildfire."

If selected to displace the troublesome cheatgrass, Sand Hollow squirreltail may help boost the survival of the Snake River Canyon's magnificent raptors.—By **Marcia Wood**, ARS.

This research is part of Rangeland, Pasture, and Forages, an ARS National Program (#205) described on the World Wide Web at <http://www.nps.ars.usda.gov/programs/nrsas.htm>.

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